THE AVIATION SECTOR IN POLAND

Invest in Poland
Polish Information and Foreign Investment Agency
www.paiz.gov.pl

1. Characteristics of the aviation sector in Poland

- The Polish aviation industry has a long tradition going back to the beginning of the 20th century. After a few years of decline, the sector once again started to grow, which is a result of a successful restructuring process in the Polish aviation sector and cooperation with international aviation companies. Moreover, thanks to the growth in aircraft and helicopter sales, the financial standing of companies on the aviation market has improved.
- Poland is famous for the production and maintenance of airplanes of all types. Manufacturing companies in Poland produce light sports, passenger, agricultural and training airplanes, as well as helicopters, gliders, and aircraft parts and accessories.
- Approximately 80 aviation companies operate on the Polish market. 90% of Poland's aerospace production is exported. A significant share of their output is exported, mainly to such countries as the USA, Venezuela, Italy, Greece, Canada, Spain, Germany, South Korea, Indonesia, Vietnam and Iraq. According to the US Department of Commerce, the aerospace industry is one of Poland's leading high- tech industries. The total value of production within this industry in 2006 was estimated at $700 million.
- Total employment in the aviation sector is over 20,000.
- After Poland's accession to the EU, there was increased competition in the civil aviation sector in Poland caused by liberalization of the air transportation industry and implementation of the "open skies" agreement. Positive changes may be observed on the civil aviation market, which is reflected by the 24.57% growth in the number of passengers at Polish airports in 2007 compared to 2006. The number of connections offered by new budget carriers and traditional carriers is growing rapidly. There is also a trend toward lower ticket prices.

2. Most important companies in the Polish aviation industry

- There are many companies operating in the Polish aviation industry. The table below presents some of them.

Company	Business profile
WSK PZL Rzeszów	production of components for turbine engines
WSK PZL Świdnik	production of helicopters (PZL-SOKÓŁ, PZL-KANIA, PZL SW-4, Mi-2, PZL Mi-2plus) and gliders (PW-5, PW-6); cooperation products and services (for example central wing box assembly for ATR-72 airplane – Aerospatiale Matra, design and manufacture of fuselage for new AB-139 helicopter – Agusta – Bell)
Pratt & Whitney Kalisz	producer of parts for aircraft engines (bevel spiral gears, gears, oil pump gears, gearshafts for accessory gear boxes, couplings, planet gearshafts, planet ring gears, stators for axial flow compressors, pump housing, tubes, tube details, carriers for planetary reduction gears, stubshafts for turbine sealing, various fixtures)
PZL Mielec	production of aircraft (M28 SKYTRUCK Passenger/Cargo Transport, M28B BRYZA Maritime Reconnaissance & Patrol, M18 DROMADER Agricultural & Fire-Fighting, M26 ISKIERKA Air Sports & Trainer, M93M) and aircraft components
Goodrich Krosno	production of landing gear components for commercial and military aircraft
WSK PZL Kalisz	producer of aircraft piston engines, gears, shafts, oil pumps, gear transmissions, screw gears etc.
EADS PZL Warszawa	production of a range of single engine aircraft including: PZL-104 MA WILGA 2000, PZL-106 BTU-34 or BT-601 TURBO KRUK, PZL-130 TC-II ORLIK
Kombinat PZL-HYDRAL	producer of power hydraulics, fuel supply and control systems for aviation; castings and forgings; components for aircraft equipment
WSK PZL-Krosno S.A.	production of landing gears for aeroplanes and helicopters; production of undercarriage for aircrafts and other equipment for aviation
Hispano Suiza (SNECMA)	Producer of gear wheels for military and civil aviation engines and gear boxes
Ultratech Sp. z o.o.	Serial production to customer orders, low volume production - mainly milling (profiling) operations. Production of special components ensuring safety of aircraft flight

Source: data from company websites

3. Cooperation connections in the aviation sector in Poland

- The main Polish cooperation within the aviation sector is the participation of LOT Polish Airlines in Star Alliance. Launched in May 1997, Star Alliance is now the largest airline alliance in the world, with 21 members: Air Canada, Air New Zealand, ANA, Asiana Airlines, Austrian, bmi, LOT, Lufthansa, SAS, Singapore Airlines, South African Airways, Spanair, Swiss, Thai Airways International, United, US Airways, Varig and TAP. Under the terms of cooperation among the partner airlines:
  - frequent flyer programme integration allows airline miles to be earned and redeemed on all members of the alliance at the same level,
  - premium customers of the alliance have access to all members' airport lounges,
  - flight schedules are coordinated to permit almost seamless travel, which may include several different carriers

within the alliance on a single ticket,
– special fares for round-the-world and similar travel on alliance members offer discounts over booking individual itineraries,
– customer service processes are harmonized in an effort to promote a consistent experience,
– cooperation in development of a common information technology platform.

- The creation of Star Alliance was a milestone in airline history due to its size. It sparked the formation of rivals, notably Oneworld and SkyTeam.
- The membership of LOT Polish Airlines in the coalition of Star Alliance strengthened the position of LOT on the Canadian and American markets, thanks among other things to the cooperation with Air Canada (AC) and United Airlines (UA). The carriers cooperate with each other not only in terms of direct connections to Toronto, Chicago and New York, but also through selected European ports, e.g. in Frankfurt, Munich and Zurich. The code share contract with UA was concluded in October 2003, and at the beginning covered inter-American flights through US transit points in New York and Chicago. In the near future the list of ports included in code share flights of LOT/UA will include Paris, Brussels, Amsterdam and London. This will improve LOT's offer on the Polish and American markets.
  Source: www.lot.com, www.staralliance.com

4. Regional, local and international airports in Poland

- Types, number of airports and number of air connections

The system of public airports in Poland used for passenger transportation includes 11 regional airports and one dominant capital airport (Frederic Chopin Airport, Warsaw), which handles most passengers using air transport.

- international connecting point

- Warsaw-Okęcie (www.lotnisko-chopina.pl)

Warsaw Frederic Chopin Airport remains the market leader among Polish airports. It is operated by Polish Airports State Enterprise (PPL). LOT Polish Airlines, the largest air carrier in Poland, has been present on the market for more than 77 years.
The company services one of the largest and fastest developing European markets, offering its clients a convenient network of air links as well as knowledge of the region, its needs and the speed of change. LOT is a medium-sized European airline, but its fleet is one of the youngest and most technologically advanced. In 2007, 9,268.551 passengers and 63.334 tonnes of cargo were handled at Warsaw Frederic Chopin Airport, which accounted for 48.43% and 73.41% of overall passengers and cargo volume, respectively, handled at the main Polish airports in 2007.

- community connecting point

- Cracow-Balice (www.lotnisko-balice.pl)

Cracow-Balice Airport is a facility used jointly by military and civil aircraft. John Paul II Cracow-Balice International Airport Ltd manages the civil part of the airport. The total area of the airport is 426 ha, including approximately 24 ha managed by John Paul II Cracow-Balice International Airport Ltd. 3,042.351 passengers and 3,801 tonnes of cargo were serviced at the John Paul II Cracow-Balice International Airport in 2007, which accounted for 15.90% and 4.41% of overall passengers and cargo volume, respectively, handled at the main Polish airports in 2007.

- regional and accessibility point

- Gdańsk-Rębiechowo (www.airport.gdansk.pl)

Lech Wałęsa Airport in Gdańsk-Rębiechowo is one of the three main international Polish airports. Its position is associated with a well-developed network of domestic and international transport connections provided in response to the growing demand for business and tourist travel. It services mainly the agglomeration of Gdańsk, Gdynia and Sopot and the whole Pomeranian Province. Gdańsk Lech Wałęsa Airport serviced 1,708.739 passengers and 4,757 tonnes of cargo in 2007, which represented 36.72% growth in the number of passengers handled and 17.85% growth in the volume of cargo handled.

- Katowice-Pyrzowice (www.gtl.com.pl)

Katowice International Airport in Pyrzowice has an important influence on the province of Silesia and to some extent Opole and Małopolska provinces. The total cargo transport serviced at the airport in 2007 was 7,782 tonnes and the number of passengers was 1,980.358, which represented 27.30% growth in the volume of cargo handled and 37.66% growth in the number of passengers handled.

- Poznań-Ławica (www.airport-poznan.com.pl)

Poznań-Ławica Airport is one of the oldest regional airports in Poland. It has been in regular operation since 1913, originally as a German military facility. Today Poznań-Ławica Airport is a dynamically expanding business. There are several factors in its attractiveness: a favourable geographical position and the highly developed economy of the Wielkopolska region. The Poznań International Fair and many joint ventures contribute to the growth of air traffic. The Airport serviced 863,018 passengers and 2,454 tonnes of cargo in 2007, which represented 35.48% growth in the number of passengers handled and 13.80% growth in the volume of cargo handled.

- Wrocław-Starachowice (www.airport.wroclaw.pl)

The history of Copernicus Airport in Wrocław goes back to the 1930's, when Starachowice Airfield was built for the needs of the German air force. In June 1945 civil aviation activities were started with a circular airlink, Warsaw-Łódź-Poznań-Wrocław-Katowice-Łódź-Warsaw. The joint-stock company Port Lotniczy Wrocław S.A. was established in January 1992.
In Airport serviced 1,708.739 passengers and 4,757 tonnes of cargo in 2007, which represented 48.13% growth in the number of passengers handled and -3.50% decrease in the volume of cargo handled.

-Szczecin-Goleniów (www.airport.com.pl)

Szczecin-Goleniów Airport was built in 1956 as a military airport. The civil airport in Szczecin-Goleniów was established in 1967 and is still being developed. In 2001 a new passenger terminal was built, and in 2005 its development began. Since April 2006 the new modern passenger terminal has been in use, which increased departure efficiency to a million passengers yearly. In 2007, 228.071 passengers and 1,774 tonnes of cargo were serviced at

Szczecin-Goleniów Airport, representing 29.09% growth in the number of passengers handled and 263.81% growth in the volume of cargo handled.

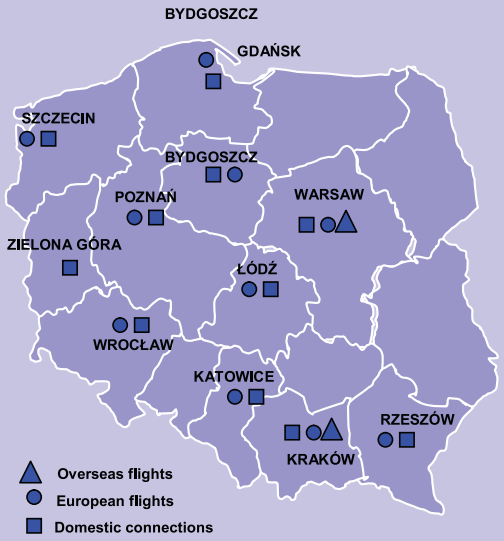
- Rzeszów-Jasionka
(www.lotnisko-rzeszow.pl)
Rzeszów-Jasionka Airport, with an area of over 560 ha, operates within the organizational structure of Polish Airports State Enterprise (PPL) as a regional port handling international air passenger and cargo traffic operations. Rzeszów Airport accommodates the newest runway in Poland. Its length of 3,200 metres makes it one of the two longest runways in Poland. The runway navigational aids enable approach and landing operations by all types of aircraft flying from all over the world in any conditions and at any time. 274.272 passengers and 508.700 tonnes of cargo were handled at Rzeszów-Jasionka Airport in 2007.

- Bydgoszcz-Szwederowo
(www.plb.pl)
The beginning of Bydgoszcz Aviation dates back to World War I, when it was founded by German aviation authorities. Activities aimed at restarting the civil Bydgoszcz Airport were undertaken in 1992 due to economic changes taking place in the country. In order to open the airport, Bydgoszcz Aviation Association Sp. z o.o. was founded, which operated until June 1995 and then was transformed into the joint-stock company Bydgoszcz Airport SA. The company continues to manage the airport and has transformed the regional airport into an international one. Bydgoszcz I.J. Paderewski Airport operates regular connections with Warsaw, charter flights and general aviation. Since 30 October 2005, I.J. Paderewski International Airport has been operating daily flights between Bydgoszcz and London. In 2007 it handled 181,576 passengers (36.51% more than in the previous year) and 411,057 tonnes of cargo (20.72% growth in comparison with 2006).

- Łódź-Lublinek
(www.airport.lodz.pl)
Łódź-Lublinek Airport was opened in September 1925. In 1996, after modernizing the airport building and restructuring the air strip, the runway and the parking apron, as well as installing new navigation lights and power supply facilities, it was awarded the status of an international airport. Now, Władysław Reymont Łódź Airport is in a phase of intensive development. The enlargement of the airstrip, parking apron and runway is coming to an end. The main target of the implemented investment is to adapt the airport to service Boeing 737 aircraft and create an attractive connection network. In 2007, 312.365 passengers and no cargo were serviced at Łódź-Lublinek Airport.

Direct flights to major European and world cities

TO	FROM
LONDON	WARSAW GDAŃSK, WROCŁAW KRAKÓW, BYDGOSZCZ SZCZECIN, RZESZÓW
COPENHAGEN	WARSAW, SZCZECIN GDAŃSK, WROCŁAW POZNAŃ, KRAKÓW
FRANKFURT	WARSAW, GDAŃSK RZESZÓW, KATOWICE WROCŁAW, KRAKÓW POZNAŃ
PARIS	WARSAW, KATOWICE KRAKÓW
MUNICH	WARSAW, WROCŁAW KATOWICE, KRAKÓW
BARCELONA	WARSAW, KATOWICE KRAKÓW
NEW YORK, CHICAGO	WARSAW, KRAKÓW, RZESZOW
TEL AVIV	WARSAW, KRAKÓW



Source: PAIiIZ

- Zielona Góra-Babimost
(www.lotnisko.zielonagora.pl)
Zielona Góra-Babimost Airport is an international airport located in the western part of Poland, 34 km northeast of Zielona Góra, the capital of Lubuskie province. It occupies a total area of 450 ha and contains cargo and passenger terminals, technical support buildings, safety installations and equipment for passenger and cargo services. There are also 16 former military hangars available, which can easily be modified for cargo storage. The airport is located at the crossroads of two major European transportation corridors, North-South (connecting Scandinavia and Southern Europe) and West-East (connecting Western and Eastern Europe).
Zielona Góra-Babimost Airport does not play an important role in the Polish aviation market, as it handled 6,739 passengers and no cargo in 2007.

- Szczytno-Szymany
(www.airport.szczytno.pl)
Szczytno-Szymany International Airport is the only airport designed for domestic and international air traffic service in Warmia-Mazury province. But it does not use its potential and is temporary closed for air traffic. In 2007 no transport activity was undertaken by Szczytno-Szymany International Airport.

• local airports
According to the Ministry of Infrastructure there are 42 local airports in Poland. The majority of them, like Kielce-Masłów Airport and Zielona Góra-Przylep Airport, are managed by Polish Aeroclub. Others are administered by the Ministry of Defence (e.g. Radom-Sadków Airport), the Military Property Agency (e.g. Modlin Airport) or military aviation plants (e.g. airport in the area of PZL Świdnik and PZL Mielec).

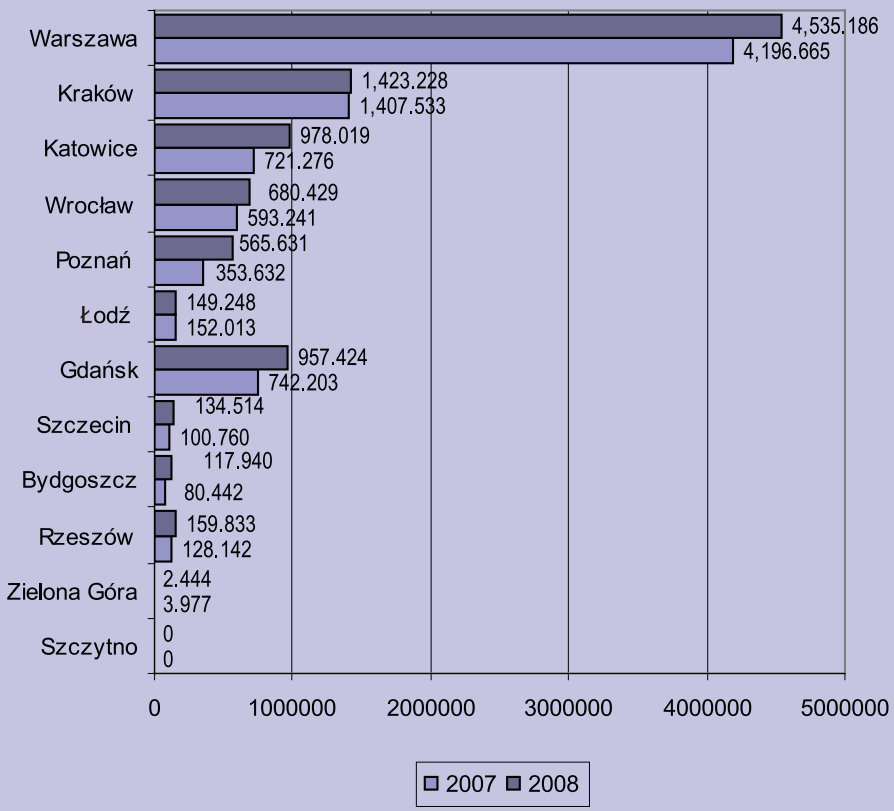
After liberalization of the air transport market in 2004 most of the regional airports (chiefly those located in major cities) have developed their own international connections, particularly with the support of cheap airlines like easyJet, Germanwings, Ryanair, SkyEurope and Wizz Air.

• Plans for airport infrastructure development
According to The Ministry of Infrastructure (former Ministry of Transport) the existing airport infrastructure cannot handle forecasted growth and that Poland needs to build new airports. The regions targeted by the Ministry or by regional authorities for new airport construction are Mazury (North Eastern part of Poland, near

Transport of cargo and passenger transport in 2007					
City	**Year founded**	**Passengers**	**Transport of cargo (tonnes)**	**Owner**	**Shares held by PPL**
Warsaw	1920/1934	9,268.551	63,333	Polish Airports State Enterprise (PPL)	67.97%
Cracow	1964	3,042.351	3,801	Port Lotniczy Kraków-Balice Sp. z o.o.	76.19%
Katowice	1966	1,980.358	7,782	Górnośląskie Towarzystwo Lotnicze S.A.	17.896%
Gdańsk	1919/1974	1,708.739	4,757	Port Lotniczy Gdańsk Sp. z o.o.	37.61%
Wrocław	1945	1,270.825	1,457	Port Lotniczy Wrocław S.A.	25.02%
Poznań	1921	863.018	2,453	Port Lotniczy Poznań-Ławica Sp. z o.o.	63.210%
Szczecin	1967	22.071	1,774	Port Lotniczy Szczecin-Goleniów Sp. z o.o.	60.356%
Rzeszów	1959	274.272	509	Polish Airports State Enterprise (PPL)	100.00%
Bydgoszcz	1929	181.576	411	Port Lotniczy Bydgoszcz S.A.	23.197%
Łódź	1925	312.365	0	Port Lotniczy Łódź Lublinek Sp. z o.o.	0.00%
Zielona Góra	1977	6.739	0	Polish Airports State Enterprise (PPL)	100.00%
Szczytno	1996	0	0	Porty Lotnicze Mazury-Szczytno Sp. z o.o.	32.52%
Total		**19,136.865**	**86,278**		
Source: Civil Aviation Office (ULC)					

Olsztyn), Podlasie (also North-Eastern part of Poland, near Bialystok), near the city of Lublin (South-Eastern part of Poland), near the city of Kielce (200 km South of Warsaw), Nowy Sącz, Gdynia, Sochaczew, Radom, and Kołobrzeg (North-Western part of Poland). Additionally, the Ministry confirmed that previous plans for construction of a new airport hub with a capacity of up to 50 million passengers were abandoned due to prevailing decentralization trends within the airport industry worldwide. This situation created a need for construction of an additional airport close to Warsaw, which would support, Warsaw Okecie Airport. A former military airport in Modlin (North of Warsaw) was chosen for low-cost carriers and charter flights. It is expected that Modlin Airport will commence operation in 2010.

Number of passengers in Polish airports in the first half of 2007 and 2008



5. Low-cost airlines transport services and their growth forecasts

- According to the Civil Aviation Office, there were 16 low-cost airlines operating on the Polish market in 2007. The leader among them, as far as the number of passengers is concerned, remains WizzAir. Ryanair is ranked second. They are followed by Centralwings, EasyJet ,Norwegian Air Shuttle and Sky Europe. These airlines are among the 10 largest carriers in Poland.
- Budget carriers transported almost 17,202,124 people in 2007. That represented a steady growth, as the number of the passengers transported in the 2006 was 14,040,816 people.
- Low-cost carriers's market share totaled 25.72% in Q1/2005, went up sharply to 43.56% in Q1/2006 and went up steadily to 48.48% in Q1/2007. At the same time, LOT's market share totaled 43.8%, dropping to 33.58% in 2006 and 31.5% in 2007.
- Liberalization of passenger air transportation, which was required upon Poland's entry into the EU, has resulted in a significant increase in the number of passengers using regional domestic airports. The number of passengers in Poland grew from 5,793,071 in 2000 through 8,834,612 in 2004, to 11,521,443 in 2005, 14,040,816 in 2006, and 19,270,848 in 2007. The number of passengers is expected to grow to 26 million in 2010, and 36 million in 2015.

6. Aviation engineering centres in Poland

- There are six engineering design centres for aviation in Poland.
- Research and development work in the field of aviation is also conducted by companies operating on the aviation market, such as PZL Świdnik, PZL Mielec, and PZL Rzeszów.
- Companies often cooperate with each other. An example of successful cooperation is the Polish aerospace industrial cluster, "Aviation Valley," which also cooperates with Rzeszów University of Technology.
- Rzeszów University of Technology is also a coordinator of the Centre of Advanced Technology "AERONET – Aviation Valley," which was established in order to conduct interdisciplinary, collective and long-term research and training programmes and effective implementation and commercialization of new technologies aimed at the aerospace industry. The AERONET partners are Lublin University of Technology, Lódź University of Technology, Silesian University of Technology, University

Air passenger transport in 2007

	passengers		passenger-kilometres		Average distance (km)
	absolute numbers	2006=100	Million	2006=100	
TOTAL	6,194.433	116.2	11,290.6	97,0	1,823
national transport	1,034.004	114.9	293,8	116,1	284
international transport	35.641	116.5	10,996,8	99,6	2,131

Source: GUS, Transport - Activity results in 2007

Air freight transport in 2007

	tonnes		tonne-kilometres		Average distance (km)
	absolute numbers	2006=100	Thousand	2006=100	
TOTAL	45,504	125,9	97,777	89,1	2,149
national transport	9,863	159,8	2,394	98,1	243
international transport	35,641	118,9	95,383	88,9	2,676

Forecasts of passenger transport in 210 – 2020 (in thousands)

	2010	2015	2020
John Paul II International Airport, Cracow-Balice	1,847.62	2,948.44	4,641.55
Lech Wałęsa Airport, Gdańsk	1,531.00	2,026.00	2,236.87
Katowice International Airport, Pyrzowice	1,294.47	2,110.56	3,165.19
Poznań-Ławica Airport	1,539.00	1,964.20	2,412.73
Copernicus Airport, Wrocław	1,042.80	1,308.00	1,465.00
Szczecin-Goleniów Airport	807.00	1,450.00	2,180.00
Rzeszów-Jasionka Airport	450.00	570.00	700.00
I.J. Paderewski Airport, Bydgoszcz	115.95	200.00	350.00
Zielona Góra-Babimost Airport	50.50	73.50	100.00
Łódź Airport	400.00	500.00	700.00
Szczytno-Szymany International Airport	86.10	200.00	360.00
Frederic Chopin Airport, Warsaw	7,450.78	9,658.28	12,304.32

Source: E. Marciszewska, D. Kaliński, "Transport lotniczy (Ekspertyza)", Warszawa, 2004

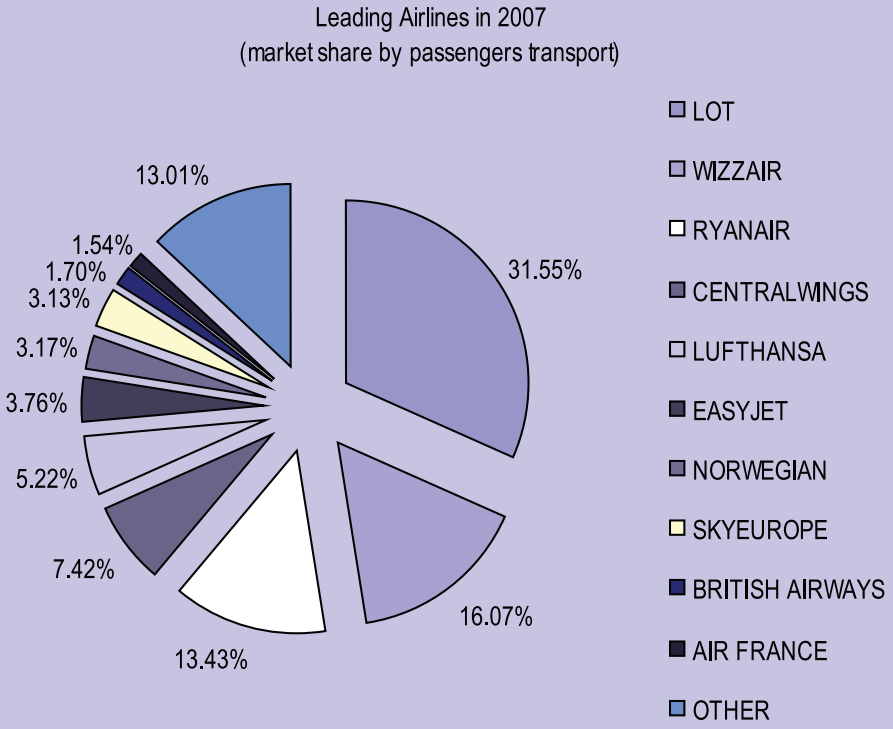
Forecasts of cargo transport in 2010 – 2020 (in tonnes)

	2010	2015	2020
Frederic Chopin Airport, Warsaw	55,423	84,095	140,312
John Paul II International Airport, Cracow-Balice	5,738	8,384	12,277
Lech Wałęsa Airport, Gdańsk	7,606	10,075	11,123
Katowice International Airport, Pyrzowice	6,900	10,800	15,300
Poznań-Ławica Airport	11,370	19,492	33,127
Copernicus Airport, Wrocław	5,666	7,797	9,319
Szczecin-Goleniów Airport	2,469	4,654	6,420
Rzeszów-Jasionka Airport	32,000	43,000	50,000
I.J. Paderewski Airport, Bydgoszcz	741	n/a	3,000
Zielona Góra-Babimost Airport	2,000	2,800	3,700
Łódź Airport	10,000	50,000	150,000
Szczytno-Szymany International Airport	1,000	2,500	10,000

Source: E. Marciszewska, D. Kaliński, "Transport lotniczy (Ekspertyza)", Warszawa, 2004

of Rzeszów, Institute of Fundamental Technological Research (Polish Academy of Sciences) and the Aviation Valley Association. (www.aeronet.pl)

- As far as research and development in the field of aviation is concerned, among 25 Polish Technological Platforms, there are also a Polish Technology Platform For Aeronautics and a Technological Park of Aircraft Industry. Their activity is very important for absorption of financial resources from the 7th Framework Programme which begun to operate in 2007.
- The Technological Park of Aircraft Industry is the new aviation project. The Aviation Industry Technology Park project was being completed between 2006 and 2008. The project, situated in the Silesia, has been developed and implemented by "Bielski Park Techniki Lotniczej", the project's managing company. The project is one of the most interesting



Source: Civil Aviation Office (ULC)

Centre	Location	Activities and employment
Avio Polska Sp. z o.o.	Bielsko-Biała	Engineering Center for design and analyses of selected high-tech aeronautical engine components (turbine disks, blades, vanes, structures, gearboxes, space propulsion parts. Product Unit for manufacturing of high-tech turbine blades for aeronautical engines. 100 engineers.
Air Force Institute of Technology	Warsaw	scientific support and research into problems of operating of products of aeronautical engineering.
Institute of Aviation	Warsaw	Fundamental research, airplane and helicopter design, aircraft engines design and testing, fatigue and dynamics analysis and tests, flight tests, avionics and system integration, engineering design services. Material Research Center.
GE Engineering Design Centre – EDC	Warsaw	Design of jet engine, including disks, turbine blades, airfoils, combustors; 200 engineers.
Pratt & Whitney Material Research Centre	Warsaw	Analytical research, testing of aircraft engine materials and structures; 40 engineers.
Pratt & Whitney Design Unit	Rzeszów	Design services within the range of aviation gearboxes as well as parts and assemblies for turbine engines.

business ventures implemented and carried out with the financial aid granted by the European Union Financial Institutions. The EU funds will contribute to the creation of the manufacturing base for aircraft manufacturers. A production line for light aircraft, an aviation research-and-development center, and a center for transportation services is a part of the project. The airport-production complex occupies an area of around 32 ha. A runway for test flights of light aircrafts with the length of 700 m and the width of 22 m is the park's major element.

- Institute of Aviation in Warsaw is a centre of research, development and design activities in aviation and related disciplines. The Institute of Aviation is a state-owned company. Activity of the Institute is strictly focused on international cooperation, integrating with European and worldwide R&D domain, in the area of aerospace and similar spheres of high-tech human endeavor. Institute employs 498 persons, highly experienced scientists and technical staff. In its laboratories, mostly of unique character, certified for ISO standards, can perform specialized tests and high accuracy, specified measurements. Declaring following abilities it remains open for B2B inquiries.

7. Potential of Polish service market – repair and maintenance of aircrafts

There is great potential for the aircraft repair and maintenance services market in Poland as more and more airlines, often suffering from financial problems, decide to outsource such services to reduce their operating costs. There is a new trend that may be observed to outsource aircraft repair and maintenance services to foreign companies (business process offshoring, or BPO) which offer lower operating costs but at the same time provide high-quality service. The opportunities for Poland in this respect are tied to the long tradition of the aviation industry in Poland, the developed airport network and growing market for air transport.[1] For example, 3M Company's Aerospace and Aircraft Maintenance Department will build an aerospace-products plant in Wroclaw, Poland, by 2009. According to the 3M Company, the next expansion into

Poland is a response to the ongoing needs of company's global aerospace customers, witch are located in Europe and Asia.

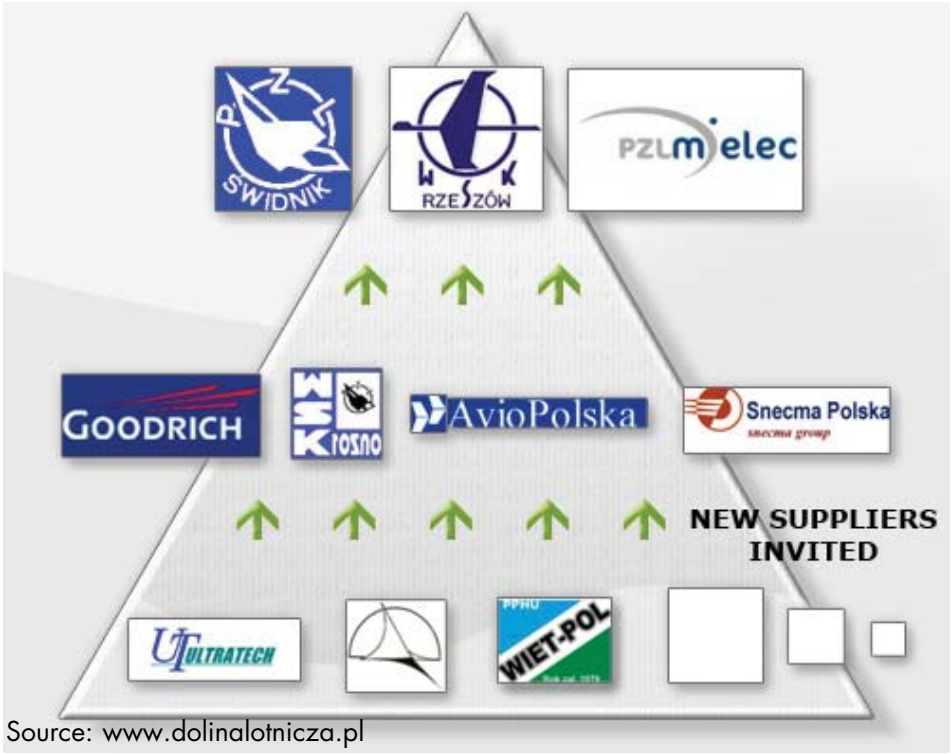
Existing investments and declarations of future investments in this sector in Poland are linked to offset programmes of individual foreign companies (e.g. Embraer, Bombardier, ATC).

LOT Polish Airlines S.A., the biggest air carrier on the Polish market, which holds a Part-145 Certificate, has its own department that provides LOT with some maintenance and repair (MOR) services. The rest of the services are supplied by the many subcontractors who cooperate with LOT. In June 1999, LOT and GE Engine Services signed a transaction agreement for the formation of an engine maintenance venture. The company, called Central European Engine Services Sp. z o.o., was established in 2000. It services LOT engines in cooperation with GE Engine Services.

8. Characteristics of the aviation industry cluster in Podkarpackie Province

Aviation Valley, located in south-eastern Poland, is famous for its aerospace industry and pilot training centres. This region has a heavy concentration of aerospace industry, scientific research centres, as well as educational and training facilities. Among the main objectives of this organization are:

- organization and development of a low cost supply chain;



Source: www.dolinalotnicza.pl

1 Source: McKinsey&Company, "Polska – centrum usług dla Europy?," Warsaw, 2003

- creation of favourable conditions to enhance the development of aerospace industry enterprises in the region;
- further development of aerospace research, aptitude and skill;
- cooperation with universities of technology, which would promote new ideas and scientific research within the aerospace industry;
- promotion of the Polish aerospace industry;
- protection of enterprises and businesses in the aerospace industry;
- influence on the Polish government's economic policy towards the aerospace industry and its domain.

The Aviation Valley Association currently represents 72 companies within the region and employ over 20,000 experienced people. The structure of their cooperation is presented in the accompanying diagram.

The latest actions of the association concern the P-4 sub-project, a Polish part of INTERREG III C ADEP. The project has been targeted at the development and promotion of an innovation cluster for companies in the aviation sector within Podkarpackie Province. Its main tasks concern:

- developing a specialized portal containing, among other items, a database of offers of enterprises related to aviation, and a database of research and personnel needs,
- cooperation with SMEs,
- intensive promotional activities such as conferences and participation in international venues,
- implementing best practices from the partners' region in various fields of the cluster development, and
- closer cooperation between R&D units and the SME sector.

9. Educational institutions in Poland with aviation-related programmes

The quality of education in the field of aviation is very high in Poland. Polish graduates offer access to a well-educated workforce.

Among the most significant higher education centers connected with the aviation sector are:

10. Part-145 Certificate

A Part-145 Certificate issued by the European Aviation Safety Agency confirms that a company meets rules and standards required in the European Union in the field of technical services of aircrafts.

- Certification procedure

Phase 1 – Pre-application

An applicant should conduct a thorough review of the appropriate regulations and advisory material to provide guidance for personnel, facility, equipment, and documentation requirements. Following this review, the applicant must address in Pre-application Statement of Intent (PASI) how these requirements will be met.

Phase 2 - Formal Application

To begin the Formal Application Phase the team will receive the application and attachments. As a rule, the team will meet with the applicant after receiving the formal application package. All questions about the proposed operation, the formal application, and attachments should be resolved at this time. The meeting should consist of the certification team members and all key management personnel from the applicant's organization.

Name of higher education institutions	Faculties	Number of students in 2007
Warsaw University of Technology	Power and Aeronautical Engineering,	29,978
Rzeszów University of Technology	Mechanical Engineering and Aeronautics	11,979
Wrocław University of Technology	Mechanical Engineering	32,092
Lódź University of Technology	Mechanical Engineering	19,501
Lublin University of Technology	Mechanical Engineering	10,016
Warsaw Military University of Technology	Aviation engineering	7,000
Silesian University of Technology	Mechanical Engineering	28,986

Higher education institutions		
Name	**e-mail address**	**Profile**
Warsaw University of Technology	www.pw.edu.pl	faculty of power and aeronautical engineering branches offering full-time studies: aerospace (automatic and On-Board-Systems, space technology, propulsion systems, aircraft structures), automatics and robotics, mechanics and machine design, power engineering
Rzeszów University of Technology	www.prz.rzeszow.pl	Centre for Air Education: the only university that educates civil pilots
Wrocław University of Technology	www.pwr.wroc.pl	mechanical faculty
Lublin University of Technology	www.pollub.pl	specialization: construction and operation of helicopters
State School of Higher Vocational Education (WSKZ), Chełm	www.pwsz.chelm.pl	faculty: piloting
Air Force Officers' Academy, Dęblin	www.wsosp.deblin.pl	faculty: aviation
Military University of Technology	www.wat.edu.pl	faculty: aviation engineering specializations: avionics, fixed and rotary wing aircraft, aviation armament
University of environment – Academy of aviation and cosmonautics, Bydgoszcz	www.wsos.edu.pl	faculty: aviation and cosmonautics
Secondary Schools and Colleges		
Name	**e-mail address**	**Profile**
European Air Technical College, Powodowo	www.technikumlotnicze.pl	avionics
Air Technical College, Zamościu	www.sop.roztocze.pl	faculty: avionics, aviation mechanics
District Centre for Vocational Education (PCEZ), Świdnik	www.zst.swidnik.pl	specializations: aviation equipment, fuselage construction
Kazimierz Wielki Secondary School, Poznań	www.czternastelo.i5.pl	class with gliding specialization
Świdnik Secondary School	www.gimnazjum3.swidnik.prv.pl	class with aviation profile
Warsaw Aviation Technical College	narwik.vdl.pl	specializations: avionics and mechanics

Phase 3 - Document Compliance
In this phase, the application is thoroughly reviewed for approval or disapproval, and the manual and related attachments are reviewed for acceptance or rejection. This review ensures both conformity to the applicable regulations and safe operating practices. This phase is done in the district office by the certification team.
Phase 4 - Demonstration and Inspection
In this phase the certification team ensures that the applicant's proposed procedures are effective and that facilities and equipment meet regulatory requirements. The Certification Project Manager must decide if demonstrations are required.
Phase 5 - Certification
Once the applicant meets the regulatory requirements of CFR Part 145, the certification team will issue the repair station certificate and operations specifications with the appropriate ratings.

Entities holding a Part-145 certificate, as of 24 July 2008

No	Name of the organization	e-mail address
1.	Wytwórnia Sprzętu Komunikacyjnego PZL- Rzeszów S.A.	www.wskrz.com
2.	Lotnicze Przedsiębiorstwo Usługowe Heliseco Sp. z o.o.	www.heliseco.pl
3.	LOT Polish Airlines S.A. Technical Division	www.lot.com
4.	Wytwórnia Sprzętu Komunikacyjnego PZL- Kalisz S.A.	www.wsk.kalisz.pl
5.	Central European Engine Services Sp. z o.o.	n/a
6.	Wytwórnia Sprzętu Komunikacyjnego PZL-Świdnik S.A.	www.pzl.swidnik.pl
7.	Zakład Naprawczy Sprzętu Lotniczego Antoni Nowak	www.nowakservice.pl
8.	WIRKK Serwis szybowców Jerzy Biskup	www.gliderservice.pl
9.	„PZL-WROCŁAW" Sp. z o.o.	www.pzl-wroclaw.com.pl
10.	ATM Przedsiębiorstwo Produkcyjne Sp. z o.o.	www.atmavio.pl
11.	KRK Airport Services	www.wzl2.mil.pl
12.	Military Aircraft Works No. 2, Bydgoszcz	www.wzl2.mil.pl
13.	PHU POLINAR	www.polinar.pl
14.	WZL-4 Engine Testing Station	www.wzl4.mil.pl
15.	EXIN	www.exin.pl
16.	SprintAir Sp. z o.o.	www.skyexpress.pl
17.	WEA Cargo Sp. z o.o.	www.wea.com.pl
18.	Samodzielny Publiczny ZOZ Lotnicze Pogotowie Ratunkowe	www.lpr.com.pl
19.	GTL-LOT Usługi Lotniskowe	www.gtllot.com.pl
20.	PZL Mielec	www.pzlmielec.splot.org.pl
21.	SKY TAXI	www.skytaxi.pl
22.	Zakład Produkcji Doświadczalnej Sp. z o.o.	www.zpd.com.pl
23.	GB AeroCharter Sp. z o. o.	www.airtaxi.com.pl
24.	NORMAL Piotr Jafernik	www.normal-jafernik.com.pl
25.	General Aviation	www.gaservingamerica.com
26.	Heli Invest	www.heliinvest.com
27.	Franklin	www.franklin-engines.com
28.	Columbus	n/a
29.	ADRIANA S.A.	www.ftoadriana.com.pl
30.	Jet Service	www.jetservice.pl
31.	Aviation Service	www.aviationservice.com
32.	PPHU Navcom Systems s. c.	www.navcomsystems.net
33.	EADS PZL „Warszawa-Okęcie" S.A.	www.zua.com.pl/
34.	Polska Agencja Żeglugi Powietrznej	www.pata.pl/index.php
35.	AUTO FUS Tadeusz Fus	www.robinsonfus.pl
35.	IBEX – U.L. Sp. z o.o.	www.ul.ibex.com.pl
37.	DRABPOL Spółka Jawna P. Drabczyński i Wspólnik	www.drabpol.pl

Source: www.ulc.gov.pl

11. Military Aircraft Works (WZL)

• Military Aircraft Works No. 1
founded in 1944
Location: Łódź
Main activities:
- elaboration of airborne equipment and flight security radio engineering equipment overhaul technology;
- overhaul of aircrafts and flight security radio equipment;
- routine and periodic maintenance of aircrafts;
- modification of aircraft interiors;

Source: www.wzl1.mil.pl
• Military Aircraft Works No. 2
founded in 1946
Location: Bydgoszcz
Main activities:
- comprehensive refurbishment of aircraft: MiG-29, Su-22, TS-11 Iskra;
- repair of aircraft: PZL-101 Gawron, PZL-110 Koliber, PZL-104 Wilga;
- modernization of SAR special purpose aircraft;
- modernization and installation of additional instruments in aircraft: GPS, VOR, ILS, DME, IFF, TACAN;
- repair and maintenance of hydraulic, pneumatic and other flight systems;
- repair of industry automatic devices;
- installation of flight decoders based on ATM-QAR-type devices.

Source: www.wzl2.mil.pl

• Military Aircraft Works No. 3

founded in 1945
Location: Dęblin
Main activities:
Overhaul services involving
- preventive and emergency repair of both military and civil airplanes and equipment;
- repair of air engines and technical units used in operation of airplanes and helicopters;
- modernization, up-grade, maintenance and servicing of airplanes, engines and a broad range of ground equipment.

Source: www.wzl3.mil.pl
• Military Aircraft Works No. 4
founded in 1951
Location: Warsaw
Main activities (depending on partnership type):

PARTNERSHIP TYPE	PARTNERSH IP SUBJECT
Second-level technical service (repair renovation) and thirdevel technical service (workshop service)	· military and civilian turbine jet engines · military and civilian helicopter turbine engines
Units (modules) re-assembly and final re assembly	· turbine jet engines · turbine helicopter engines · auxiliary turbine engines
Stand acceptance tests	· turbine jet engines · turbine helicopter engines · auxiliary turbine engines
Units re-assembly and stand tests	· fuel units · oil units · electric units
Production and repairs of	· airfield equipment for aircraft and aircr engines, technical service equipment
Sales	· engines · engine equipment · engine modules · spare parts andmiscellaneous items · aircraft and aircraft engines service equipment and tools
Extra-aviation partnership in production and repairs	· machine industry products
Space to let	· office space · industrial and/or warehouse space

Source: www.wzl4.mil.pl

12. Characteristics of fleet and technical base of the national carrier, LOT Polish

Airlines

The strong point of LOT is its modern fleet and its comprehensive network of air connections covering the major cities around Western and Central-Eastern Europe as well as the USA and Canada. Year after year the overall number of passengers using Polish Airlines LOT is increasing.

LOT is the largest Polish airline, with 54 modern airplanes:

- Five Boeing 767-300 ER airplanes
- Two Boeing 767-200 ER airplanes
- Two Boeing 737-400 airplanes
- Six Boeing 737-500 airplanes

and smaller planes offering both business and economy class seats:

- Four Embraer-175 airplanes
- Ten Embraer-170 airplanes
- Eleven Embraer ERJ-145 airplanes
- Eight ATR-72 airplanes
- Six ATR-42-500 airplanes

According to the past annual reports, forecasts for the future development of LOT Polish Airlines are optimistic. Thanks to the membership in Star Alliance, the Polish national airline has become a part of a global network with broad access to multiple destination points. This provides additional ground for optimism in the airline's future outlook. The number of passengers as well as revenues are definitely expected to grow, thanks both to the number of flight connections offered and the growing confidence based on the stable image of the company on domestic and foreign markets.

LOT Polish Airline	Annual reports		
	2007	2006	2005
Revenue from core activity (mln PLN)	2 983,0	2 761,4	2771,7
Operating profit/loss (mln PLN)	94	13	91,9
Net profit/loss (mln PLN)	161	539,8	88,6
Number of total passengers carried of which :	4 278 983	3 708 239	3 578 202
- scheduled flights	4 269 655	3 701 370	3 553 681
- international flights	3 276 972	2 843 586	2 749 453
- domestic flights	992 683	857 784	804 221
- charter flights	9 138	6 869	24 521
Cargo carried (thou. Tons)	22,6	24,6	20,5

Source: www.lot.com

14. Prospects for the aviation sector in Poland

- Poland may become the world's leading producer of light aircraft, because of its tradition, human resources (experienced staff) and the necessary infrastructure.
- Significant opportunities for the aviation sector involve:

o development of design activities at engineering design centres,

o development of maintenance activities at aircraft maintenance centres,

o development of a low cost supply chain.

- As far as passenger air transport is concerned, growth depends on government policy and the policy of agencies responsible for the aviation sector. To stimulate market growth, Polish government and local governments should support an increase in domestic traffic and agree to lower aircraft fees.
- Great advantages for both cargo and passenger air transport are connected with the development of regional airports in Poland. Local authorities, with the help of EU funds, may develop existing airports (such as military airports and airports owned by aeroclubs) as well as build new ones. Such initiatives may be taken in the form of public-private partnerships (PPP).
- There is a threat, that the air carrier market in Poland is formerly dominated by the national carrier, LOT Polish Airlines. However, LOT's market share is being steadily eroded by low cost airlines, which began operation in Poland in summer 2004. In 2005, LOT's market share totaled 43.8%, dropping to 33.58% in 2006 and 31.5% in 2007 due to more open competition. The treasury ministry plans a full privatisation of the national airline PLL Lot, but, the process could be held after 2008.
- Experts say that the main disadvantage for the Polish aviation sector results from the fact that there is no clear strategy for its development.
- Poland's strengths in the aviation sector are: country's traditions in the aviation sector, the development of manufacturing and R&D by the existing foreign investors, competitive production costs, the availability of qualified personnel and other favorable factors relating to the aviation cluster, a well developed network of sub-contractors, the activity of the Aviation Valley Association (72 firms, over 20 000 workplaces, 80% the production is mainly exported), a large network of international and national airports – 11 in all, a well developed structure in education and training.

Most important foreign investors in the aviation sector in Poland in 2007

Investor	Country of origin	Activities (NACE)	Activities (class)
United Technologies Holding S.A.	USA	Manufacture of transport equipment	Manufacture of aircraft and spacecraft
Pratt & Whitney Canada	Canada	Manufacture of transport equipment	Manufacture of aircraft and spacecraft
Goodrich Aerospace Canada LTD	USA	Manufacture of transport equipment	Manufacture of aircraft and spacecraft
Valin Participations	France	Manufacture of transport equipment	Manufacture of aircraft and spacecraft
Smiths Group Aerospace	United Kingdom	Manufacture of transport equipment	Manufacture of aircraft and spacecraft
AS Propulsion International B.V.	The Netherlands	Manufacture of transport equipment	Manufacture of aircraft and spacecraft
General Electric	USA	Manufacture of transport equipment	Manufacture of aircraft and spacecraft
EADS CASA	Spain	Manufacture of transport equipment	Manufacture of aircraft and spacecraft
Hispano Suiza Sp. z o.o. (SNECMA)	Spain	Manufacture of transport equipment	Manufacture of aircraft and spacecraft
MTU Aero Engines	Germany	Manufacture of transport equipment	Manufacture of aircraft and spacecraft
Sikorsky[2]	USA	Manufacture of transport equipment	Manufacture of aircraft and spacecraft
Boeing	USA	Manufacture of transport equipment	Manufacture of aircraft and spacecraft
Avio Group	Italy	Manufacture of transport equipment	Manufacture of aircraft and spacecraft

Source: Polish Information and Foreign Investment Agency (PAIiIZ)

2 Source: www.pzlmielec.pl

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